

## CLAIMS

### What is Claimed is:

1. A nanostructure sensor for sensing a target species, comprising:  
at least one nanostructure;  
5 at least two conducting elements in electrical communication with the at  
least one nanostructure;  
a polymer layer on the at least one nanostructure.
2. The nanostructure sensor of Claim 1, wherein the at least one  
nanostructure is selected from the group consisting of nanotubes, nanowires,  
10 nanofibers, and nanorods.
3. The nanostructure sensor of Claim 1, wherein the at least one  
nanostructure comprises a single-wall carbon nanotube.
4. The nanostructure sensor of Claim 1, wherein the at least two conducting  
elements comprise metal electrodes.
- 15 5. The nanostructure sensor of Claim 1, wherein the at least two conducting  
elements are in direct physical contact with the at least one nanostructure.
6. The nanostructure sensor of Claim 1, wherein the polymer layer is  
selected to interact with the target species.
7. The nanostructure sensor of Claim 1, wherein the polymer layer on the at  
20 least one nanostructure is discontinuous.
8. The nanostructure sensor of Claim 1, wherein the polymer layer  
comprises more than one material.
9. The nanostructure sensor of Claim 1, wherein the target species  
comprises ammonia and the polymer layer is PEI.

10. The nanostructure sensor of Claim 1, wherein the particular species comprises hydrogen and the polymer layer is PEI.

11. The nanostructure sensor of Claim 1, further comprising a gate electrode.

12. The nanostructure sensor of Claim 1, further comprising passivation material covering regions in which there is electrical communication between the at least two conduction elements and the at least one nanostructure.

13. A method of making a nanostructure sensor for sensing target species, comprising:

providing at least one nanostructure;  
10 making electrical contact to the at least one nanostructure with at least two conducting elements;  
coating the at least one nanostructure with a polymer selected to interact with the target species.

14. The method of Claim 13, further comprising covering regions where the at least two conducting elements make contact to the at least one nanostructure with a passivation material.

15. The method of Claim 13, further comprising providing a gate electrode.

16. A method of sensing target species, comprising:  
providing at least one nanostructure;  
20 making electrical contact to the at least one nanostructure with at least two conducting elements;  
coating the at least one nanostructure with a polymer that interacts with the target species and, in response to the interaction, effects a change in the at least one nanostructure that can be measured electrically;  
25 measuring an electrical signal from the at least one nanostructure; and  
correlating the electrical signal to sensing of the target species.

17. The method of Claim 16, further comprising providing a passivation material to cover regions where the at least two conducting elements make electrical contact to the at least one nanostructure.

18. The method of Claim 16, further comprising providing a gate electrode.